

NASA AND THE ENERGY DEPT. ARE USING a high-altitude Altus UAV, teamed with a piloted DHC-6 Twin Otter, to measure solar energy reflected from high-altitude cirrus clouds in an effort to understand the climatic effects and possible influence on global warming. The study also is measuring the warm longwave radiation, absorbed by the clouds from the Earth's surface, which keeps heat in the atmosphere. Sandia (N.M.) National Laboratories is guiding the studies, using flights in the vicinity of Kauai, Hawaii. Altus flies at 50,000 ft., while the Twin Otter flies directly under it at 10,000 ft. Both have a number of radiometers, including zenith and nadir radiometers, to measure direct and reflected solar energy, and a scanning polarimeter that breaks the energy into 55 spectral bands between 0.4 and 2 microns. The optical properties, ice particle size and form of ice in the cloud are characterized using a downward-looking 1.054-micron, micropulse lidar on the Altus, and an upward-looking 95-GHz. airborne radar on the Twin Otter. The Twin Otter pilot aligns himself under Altus using a display of the data-linked GPS position from the UAV. Airspeeds match well, according to the researchers. ➔